

SAFETY AND HEALTH HAZARDS

Introduction

In general, safety hazards are conditions, such as unguarded machinery or cluttered work areas, that can cause injuries. Health hazards are conditions or substances, such as asbestos, that can cause illness.

Safety and health hazards may combine to pose an even greater danger to workers. For example, noise, while primarily a health hazard that can cause hearing loss - also can contribute to injuries by making it hard for workers to hear warning signals. Stress, a major health problem can be caused by working in an environment with safety or other health hazards such as hot equipment or noise.

Health Hazards

What are health hazards?

A health hazard is any chemical or biological substance or physical stressor that causes or aggravates illness in humans. Chemical health hazards occur in many different forms. They can be liquids, such as benzene; solids, such as silica dust; or gases, such as hydrogen sulfide.

The illnesses caused by exposure to chemical health hazards range from dizziness, nausea, and skin rashes to lung and liver disease, reproductive problems, and cancer.

In addition, heat stress and ergonomic hazards such as repetitive motion and awkward postures that contribute to cumulative trauma disorders, are common industrial problems.

Normally, it is much easier to determine the cause of an injury on the job than it is an illness due to the following reasons:

- The chemical substance causing the disease may be odorless or invisible.
- Symptoms may be mistaken for common non-occupational illnesses.
- Diseases may not become apparent until many years after the exposure to a hazardous substance.
- The disease or illness may result from a combination of chemicals, substances, or stressors making the exact cause more difficult to identify.

Routes of Entry

Chemical health hazards can enter the body in different ways:

- Inhalation - *from the lungs into the blood stream.*
- Absorption - *through the skin into the blood stream.*
- Ingestion - *through digestive tract into the blood stream.*

Types of Hazard Controls

Since it is in most cases impossible to eliminate all hazards from the work area, hazards must be contained so that workers are not exposed. Protective clothing and equipment, the least effective way to prevent exposure, should be used only as a last resort.

Engineering Controls

Engineering controls, which involve changes in a machine, work process, chemical, or a building, that eliminate or reduce exposure to health hazards are recommended by OSHA as the best method to control hazards.

Engineering controls are desirable because they eliminate or reduce the amount of hazards in the work place. To be totally effective, regular monitoring and preventive maintenance are essential to ensure effective operation of the system.

Examples of engineering controls include:

- Substitution - *could change eliminate the hazard?*
- Enclosure or Isolation - *remove or enclose the hazard.*
- Ventilation

Administrative Controls

Administrative controls are used to reduce the number of workers who are exposed to a hazard or to distribute the exposure among more workers so that each worker's exposure is less. Administrative controls do not eliminate or reduce the amount of the hazard in the workplace.

Examples of administrative controls include:

- Changing work schedules
- Implementing longer rest periods or shorter work shifts.
- Moving process to an isolated area.
- Moving process to a different work shift to limit exposure.

Personal Protective Equipment

Personal protective equipment does reduce exposure to hazards but it is the least desirable protection because it may be uncomfortable, used improperly, or fit poorly. Protective equipment requires ongoing worker training, monitoring, surveillance and cost.

Examples of personal protective equipment include

- Safety glasses and goggles
- Earplugs
- Respirators and dust masks
- Gloves

Common Health Hazards and Violations

The following represent only some of the most common violations of the C)SHA standards for each hazardous condition listed.

■ Noise

Work areas or processes where it is necessary to shout to hold conversations have noise levels high enough to damage hearing. The use of earplugs or earmuffs does not supply adequate protection in all cases.

1910.95(a): Employer failed to utilize feasible administrative or engineering controls to reduce sound levels.

1910.95(c): A continuing, effective hearing conservation program was not instituted.

1910.95(i)(1): Hearing protectors were not made available to employees exposed to high noise levels.

■ Hazardous Chemical Exposure

Using, handling, or conveying any type of hazardous chemical may present a health risk to employees in the workplace.

The chemical may be present in the air as a gas or vapor (either visible or invisible), or as dust, mist, fiber or fume. Contact with the body may occur by breathing in contaminated air or by splashing or otherwise contacting skin or eyes.

Types of hazardous chemicals include gasoline, solvents, cleaning supplies, paints, pesticides, minerals, and wood dusts as well as a wide range of chemicals used in industrial operations. As in the case of earplugs or muffs, use of respirators not a guarantee of adequate protection from hazardous chemicals.

1910.94(d)(9)(vi): Employees were not required to wear respirators in areas with dangerous open surface tanks.

1910.94(d)(9)(vii): Emergency showers were not provided in areas with dangerous open surface tanks.

1910.132(a): Protective equipment was not used when necessary to protect employees.

1910.134(a)(2): Respirators were not provided to employees where necessary to protect them from hazards.

1910.1200(h)(2)(iii): Employees were not told the measures to be taken to protect themselves from chemical hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals.

Safety Hazards

OSHA's safety standards are primarily concerned with the elimination of unsafe conditions. While it is important that workers follow safety rules, history shows that eliminating unsafe conditions is a far more effective way to reduce injuries than merely urging workers not to hurt themselves.

In general safety hazards are much more noticeable in the workplace than health hazards. For example, unguarded drive belts and pulleys are highly visible, whereas gasoline vapors or lead fumes are nearly invisible.

Also, employee exposure to safety hazards most often provokes an acute response whereas many health hazards have primarily chronic effects.

As with health hazards, OSHA looks to engineering controls and then administrative controls as the preferred methods to control health hazards.

Engineering controls seek to eliminate or isolate the hazard thereby reducing the number of hazards in the workplace.

Common Safety Hazards/Violations

■ Housekeeping

Workplaces and workrooms should be clean, orderly and as far as possible, dry. Aisleways and passages should be kept clear and in good repair and permanent aisles should be marked.

1910.22(a)(1): Places of employment were not kept in a clean, orderly, and sanitary condition.

1910.22(b)(2): Permanent aisle(s) or passageway(s) were not appropriately marked.

■ Floors and Wall Openings

Openings and holes should be covered or guarded to prevent trips and falls. Open-sided floors, runways and platforms more than 4 feet above the floor or near or above dangerous machinery should be guarded.

1910.22(c): Guards and covers were not provided to protect employees from hazards.

1910.23(a)(3): Hatchway or chute floor openings were not covered.

1910.23(a)(8): Floor holes into which persons could walk were not guarded.

■ Ladders and Stairs

Stairs should be equipped with railings if over four risers high.

Ladders should be in good repair with no splits, cracks or broken/missing rungs.

1910.23(d)(1)(i): Flights of stairs over four users high were not provided with railings.

1910.25(d)(1)(x): Portable wooden ladders with defects were not removed from service.

■ Scaffolding

Scaffolding should be on solid footing, have an access ladder, and if over 10 feet above the floor, be provided with guardrails.

1910.28(a)(3): Guardrails and toeboards were not installed on all open sides and ends of a platform more than 10' above the ground or floor.

■ Means of Egress

Exit doors should be marked, kept clear and not blocked or locked at all times.

1910.36(b)(4): Exits from buildings were not arranged and maintained as to provide free and unobstructed egress.

1910.37(q)(1): Exits or access to exits were not marked by a readily visible sign..

■ Flammable and Combustible Liquids

Large quantities of flammable and combustible liquids should be kept inside special storage rooms or fireproof cabinets away from sources of ignition. "No Smoking" or other warning signs should be posted.

A fire extinguisher should be in close proximity to the storage area.

1910.106(e)(2)(ii)(b)(1): More than 25 gallons of Class 1A flammable liquid was located outside of an inside storage room or cabinet.

1910.106(f)(6): Class 1 flammable liquids were handled, drawn, or dispensed where the vapors could reach a source of ignition.

■ Spray Painting

Spray painting should generally be done inside a special area, room or booth designed for such operations. There should be no flames, open electrical circuits or other sources of ignition near the spray area. Paints, solvents, and thinners should be stored as flammable liquids if present in large quantities. Smoking is prohibited in spray areas.

1910.107(c)(2): Open flames or spark producing equipment were located in the spray painting area.

1910.107(g)(1): Spraying was conducted outside of spray areas.

1910.107(g)(7): "No Smoking" signs were not posted at spray painting or paint storage areas.

■ Sanitation

Toilet facilities and potable water for washing and drinking must be available.

1910.141(c)(1)(i): Toilet facilities were not provided.

1910.141(d)(2)(i): Lavatories were not provided.

1910.141(d)(2)(ii): Lavatories were not provided with hot and cold water or tepid running water.

■ Machine Guarding

Machine operators and other people in the area must be protected from points of operation, nip points, rotating parts, flying chips, and sparks. Saw blades, belts and pulleys and other parts of saws, table saws, radial arm saws, swing cut-off saws, band saws and other types of woodworking saws must be guarded.

Wheels of abrasive wheel grinding machines must be guarded and employees using them should wear protective equipment if necessary.

Employees doing maintenance or service work on machines should be protected by lockouts or tagouts that would prevent the machines from being started.

1910.212(a)(1): Machine guards were not provided to protect employees from hazards.

1910.212(a)(3)(ii): Points of operation of machinery were not guarded to protect employees.

■ Mechanical Power Transmission

Any belt, chain, pulley, shaft and rope drive less than 7 feet from the floor or located where employees can come into contact with them should be guarded or barricaded.

1910.219(d)(1): Pulleys within 7' of the floor were not guarded.

1910.219(e)(1)(i): Horizontal belts less than 7' above the floor were not guarded.

■ Welding Operations

Welding operations should be separated or shielded from other employees in the area.

Compressed gas and fuel cylinders should be stored properly, capped and secured from movement and properly marked as to contents. Oxygen cylinders should be kept separate from fuel gas cylinders and other sources of combustion. Employees should wear protective

equipment while welding.

The work area should be well ventilated to remove smoke and weld fume.

1910.252(b)(2)(i)(a): Arc cutters, helpers and attendants were not provided with proper eye protection.

1910.252(b)(2)(iii): Workers adjacent to welding operations were not protected by screens.

1910.252(c)(2)(i): Mechanical ventilation was not provided when welding or cutting operations were done on certain metals.

■ Electrical

Electrical installations should be marked as to function, protected from damage, and accessible at all times to authorized employees. Extension cords, switches, receptacles, light fixtures and other electrical equipment should be in good repair with no exposed wires or conductors that employees could come into contact with.

1910.303(f): Disconnecting means of motors and appliances were not legibly marked to indicate their purpose.

1910.303(g)(2)(i): Live parts of electrical equipment operating at 50 volts or more were not guarded against accidental contact by approved cabinets or other means.

1910.305(j)(1)(i): Fixtures, lampholders, lamps and receptacles less than 8' above the ground had exposed live parts.

1910.305(j)(2)(ii): A receptacle used in a wet location was not suitable for that location.

■ Material Handling/Forklifts

Aisleways and passageways where forklift trucks travel should be smooth and level. Operators should be trained in forklift safety and operation. Overhead protectors should be in place if the operator lifts loads above head level.

1910.178(l): Forklift truck drivers had not been trained in the safe operation of a powered industrial truck.

1910.178(m)(9): Overhead guards were not used to protect the operator from falling objects.